

September 12, 1975

National Science Foundation
Washington, D.C. 20550

Dear Dr. Thieme,

I regret that I did not succeed in replying to your letter of July 1, 1975 during a somewhat chaotic summer. I hope that these rather feeble notes may still be of some use to you.

My own approach to such matters is to think about "solutions"; we may not know whether we have a problem, or situation, or a milieu to which we have become habituated until we explore possible directions of change. But then that perhaps leaves me a bit depressed since it is difficult for me to make proposals that I could believe would be likely to be implemented in the current political climate.

Nevertheless!

1. My most vexing concerns undoubtedly stem from the unremitting bureaucratization of academic and scientific work. It is sadly true that I must spend more and more of my time in filling out forms or arranging that this be done, and perhaps even more stridently in anxiety about the continuity of support for my work. It is not necessarily a blessing that I have doubtless been far more fortunate than most in building the financial base for my research activities since this simply keeps me in a highly exposed and extended position in order to fulfill my responsibilities to the people that have come to depend on this activity. Needless to say, a number of personal adaptations to this situation are possible. However, these would be in the direction of maintaining one's activity and commitments at the absolute minimum for which some high degree of assurance was possible about continuity of support. I just do not think very much thought has ever been given to the personal and institutional consequences of the periodic and severe scrutiny which is given to the administration of research funds and the concomitant dependence upon these that is now entailed in an academic career in a scientific subject.

Doubtless, this is almost all unavoidable in the current political climate of accountability and of criticism of the extent of existing support for scientific work. Our problems are undoubtedly compounded by the side-effects of the annual appropriation process which defeats reasonable efforts at long-range planning. It is not just a hypothetical possibility that on a few months notice I discover that there will be no money next year for maintaining my laboratory - such things have happen to me in the past and I am sure to many, many others as you know. I just do not think this is a

climate that is really conducive to very reflective thinking about the deeper issues of science, and I think it does result in an increasing pre-occupation with very concrete minutiae for which some results can be guaranteed rather than in more adventurous probes that could obsolete large segments of contemporary grubbing.

Plainly there would be serious problems in trying to implement policies that allowed for this kind of scientific style since it could hardly be made a universal one. Quite apart from problems of inequity, one may also question whether many people's creative motivation might not be impaired by the lack of periodic external goads. But I do not think that our current policies for the support of scientific work have been arrived at by any rational examination of these institutional and personal career patterns.

Besides the technique of annual funding, another way in which federal support of research interferes with the maintenance of a creative atmosphere is inherent in the concept of a research project grant itself. We simply have no source of working capital upon which to rely for the development of ideas to bring them to a grantable stage; nor do we have any means of accumulating profits that could function as carry-over funds in the event of intermittent drought. That there is then a great deal of turbulence in the minds of people trying to do science in these contingencies is inevitable. But as already indicated, perhaps these are unavoidable in any scheme for very large-scale federal support for research which has its own positive values. And I would hardly want my remarks to be used as an argument for simple quantitative cut-backs in funding, especially as these are a much more likely consequence of further political action than any other form of revision of the scientific-academic process.

A point which is almost the same issue is the virtual disappearance of younger faculty recruitment from institutions like my own and the inevitable senescence that must soon overtake us.

2. I am also deeply interested but have less to offer by the way of constructive comment in the problems of internal constraints on creativity - the intellectual and institutional obstacles to really innovative thinking and path-finding which are merely accentuated by the current pattern of grants administration.

As a final comment, your query moves me to the rejoinder that the process of perfection of science is almost too important to be left to scientists. The trouble is the difficulty of identifying any other community likely to do a better job! What I have in mind though is that the kinds of questions that you are posing deserve much more thoughtful analysis than they are likely to get by virtue of brief answers to this kind of questionnaire. On the other hand, the commentators about science tend either to have rather rigid policy oriented concerns, or like the sociologists and historians of science until quite recently to be too far removed from the current actualities of scientific work. Fortunately, there are some signs of change in regard to the latter, and I would hope that among the tasks taken up by the NSF would be more explicit encouragement for the kind of reconciliation that can perhaps help us better understand what science is really all about and how to do it better.

Sincerely yours,